915 KF Ti-Touch

Tutorial

8.915.8002EN

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This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

Table of contents

1 Introduction

1.1 Structure of the tutorial

This tutorial describes the installation and the first steps with the 915 KF Ti-Touch. You will be guided step-by-step through the most important dialog pages by using a titer determination with a water standard, followed by the water content determination of a sample as an example. In addition, you will find information regarding titrations with extended functions and for user administration.

1.2 Additional information

You will find general information about Karl Fischer titration in the Multimedia Guide on CD. You can order this from your Metrohm representative. Detailed information concerning the 915 KF Ti-Touch can be found in the manual.

1.3 Symbols and conventions

The following symbols and formatting may appear in this documentation:

*(5-**12**)*	**Cross-reference to figure legend** The first number refers to the figure number, the second to the instrument part in the figure.
1	**Instruction step** Carry out these steps in the sequence shown.
Method	**Dialog text**, **parameter** in the software
File ▸ New	Menu or menu item
[Next]	**Button** or **key**
	**WARNING** This symbol draws attention to a possible life-threatening hazard or risk of injury.
	**WARNING** This symbol draws attention to a possible hazard due to electrical current.

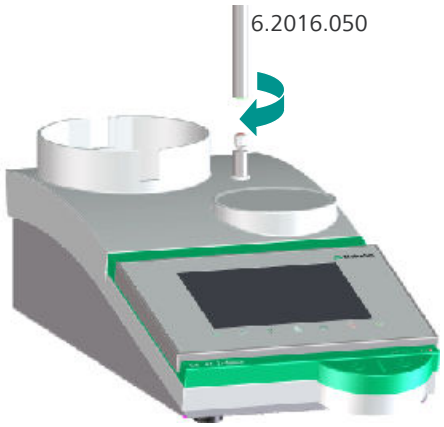
	**WARNING** This symbol draws attention to a possible hazard due to heat or hot instrument parts.
	**WARNING** This symbol draws attention to a possible biological hazard.
	**CAUTION** This symbol draws attention to possible damage to instruments or instrument parts.
	**NOTE** This symbol highlights additional information and tips.

2 Installation

2.1 Setting up and connecting the instrument

915 KF Ti-Touch

Mounting the stand



Plugging in the power cord

WARNING

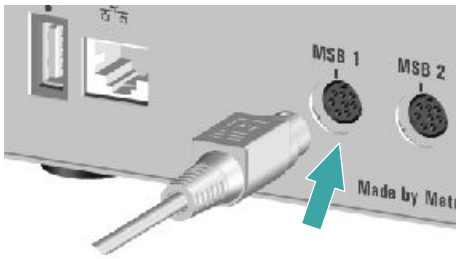
An incorrect supply voltage can damage the instrument.

Operate the instrument only with the supply voltage specified for it. Use the supplied power supply unit exclusively.

NOTICE

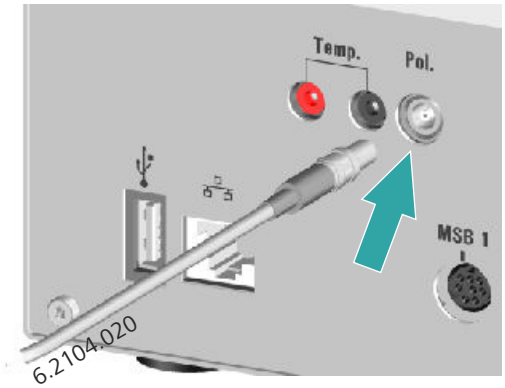
The plug of the power supply unit is protected against accidental disconnection of the cable by means of a pull-out protection feature. If you wish to pull out the plug, you need to pull back the outer plug sleeve marked with arrows.

Connecting an 800 Dosino to MSB 1



Observe the marking on the socket.

Connecting the electrode cable



NOTICE

The electrode cable is protected against accidental disconnection of the cable by means of a pull-out protection. If you wish to pull out the plug, you first need to pull back the outer plug sleeve.

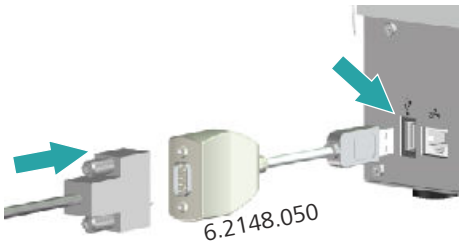
Connecting printers or other USB devices

A printer can be connected directly to the USB connector (Type A) (with a 6.2151.020 connecting cable), as can a USB keyboard, a barcode reader or a USB flash drive (for storing and loading methods, etc.).

If several USB devices are to be connected, then it is recommended that a USB hub (available from specialty stores) be used. The USB hub then functions as a distributor to which several USB devices can be connected.

Connecting a balance

As a rule, balances are equipped with a serial RS-232 interface. To connect a balance, you require a USB/RS-232 adapter (6.2148.050).



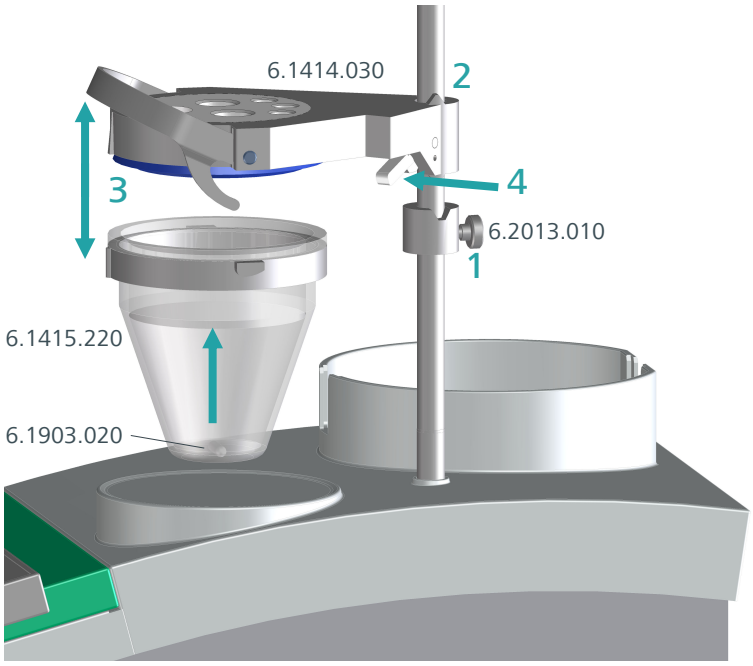
The USB/RS-232 adapter can be connected to the 915 KF Ti-Touch directly or by means of a USB hub.

Connect the 9-pin plug of the respective balance connecting cable to the RS-232 connector. Consult the manual for the balance or the manual for the 915 KF Ti-Touch in order to select the correct connecting cable.

The parameters for the RS-232 interface must match those on the instrument and those on the balance. For this purpose, check the manual for the balance and the manual for the 915 KF Ti-Touch.

2.2 Setting up the KF titration cell

Mounting the KF titration cell

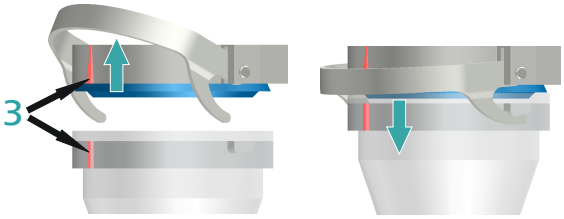


Mount the KF titration cell as follows:

1 Screw the 6.2013.010 clamping ring tightly to the support rod.

2 Fix the vessel lid 6.1414.030 of the KF titration cell (with correctly inserted sealing ring from the sealing set 6.1244.040) to the support rod. Keep the locking lever pressed down until it can be released at the desired position.

3 Fasten the 6.1415.220 (or 6.1415.250) titration vessel with a 6.1903.020 (or 6.1903.030) stirring bar inside on the vessel lid. Fold back the holding bracket upwards while doing so. The markings on the vessel lid and on the plastic ring must be aligned above one another. Afterwards, press the holding bracket downwards in order to fix the titration vessel. The levers of the holding bracket must enclose the pins of the plastic ring on the titration vessel in order to ensure a secure hold.



4 Adjust the height of the KF titration cell by pressing the locking lever. It should almost touch the surface of the stirrer. The position can now be fixed by readjusting the clamping ring.

Once the height of the KF titration cell has been adjusted correctly, the entire cell can be raised and swiveled as required by pressing the locking lever.

Filling the adsorber tubes

The 6.1403.040 and 6.1609.010 adsorber tubes must be filled with 6.2811.000 molecular sieve prior to mounting. Proceed as follows:

1 Insert a small cotton plug into the bottom of the two adsorber tubes. Do not pack the cotton too tightly.

2 Fill up the molecular sieve up to the ¾ level.

3 Place a small cotton plug on the molecular sieve. Do not pack the cotton too tightly.

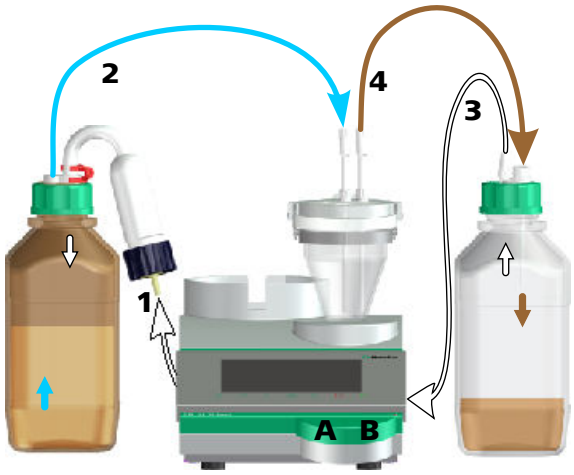
4 Seal the adsorber tubes with the appropriate covers.

2.3 Setting up the aspiration and solvent bottle

Mode of operation of the built-in pump

With the built-in pump, one can on the one hand add fresh solvent (dehydrated methanol or a special KF solvent) easily at the press of a button, while on the other hand one can also suction out the KF titration cell at the press of a button. This can be accomplished if all of the required tubing connections have been set up correctly and if all of the connectors have been screwed tightly enough to seal.

The following diagram gives an overview of the mode of operation:



1. Air will be pumped into the solvent bottle (on the left) for as long as the left-hand key **A** is kept pressed down.

2. The overpressure in the solvent bottle pushes fresh solvent into the KF titration cell.

3. Air will be suctioned out of the aspiration bottle (on the right) for as long as the right-hand button **B** is kept pressed down.

4. The vacuum in the aspiration bottle suctions the liquid out of the KF titration cell and into the aspiration bottle.

CAUTION

If you work with a full solvent bottle, it may happen that the liquid level in the solvent bottle will be higher than that in the titration cell.

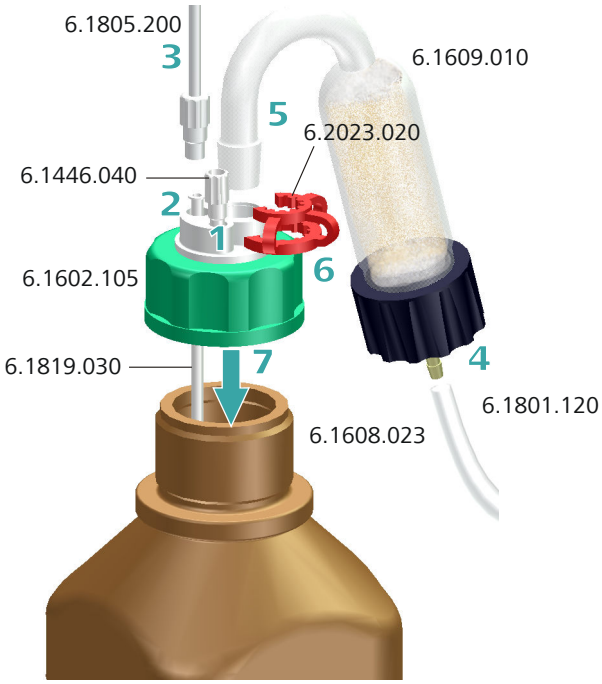
If this is the case, then additional solvent will be pumped into the titration cell, even after you have already released the left-hand button.

Lift the titration cell up far enough that the liquid level in the titration cell is higher than that in the solvent bottle.

Setting up the solvent bottle

Methanol or KF solvent is pumped out of the supply bottle by overpressure and into the KF titration cell. All of the bottle cap connectors must be leak-proof for this reason.

Metrohm offers suitable thread adapters for bottles with other threads than GL 45.



To equip the solvent bottle, proceed step-by-step as follows:

1 Place a 6.1446.040 threaded stopper in the M6 connector (smallest opening) of a 6.1602.105 bottle cap and screw it tightly.

2 Insert the long 6.1819.030 PTFE cannula into the M8 connector (second-smallest opening) of the bottle cap.

3 Insert a 6.1805.200 PTFE tubing into the M8 connector of the bottle cap and screw it tightly.

4 Cut off a piece (approx. 1 m) of the PVC tubing 6.1801.120 and connect to the adsorber tube 6.1609.010 filled with molecular sieve.

5 Place the adsorber tube with the SGJ 14 standard ground-joint on the bottle cap.

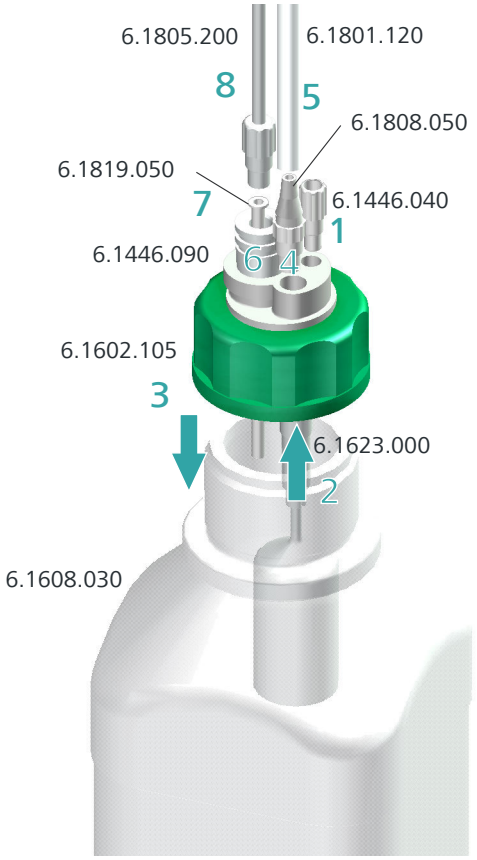
6 Secure the SGJ 14 standard ground-joint of the adsorber tube with the 6.2023.020 SGJ clip.

7 Place the completely loaded bottle cap 6.1602.105 on the amber glass bottle 6.1608.023 filled with methanol or KF solvent, respectively, or on a reagent bottle from your chemicals manufacturer and screw it tightly.

Setting up the aspiration bottle

The aspiration bottle is used as a waste container and must be sealed against leaks.

Metrohm offers suitable thread adapters for bottles with other threads than GL 45.



To equip the aspiration bottle, proceed step-by-step as follows:

1 Place a 6.1446.040 threaded stopper in the M6 connector (smallest opening) of a 6.1602.105 bottle cap and screw it tightly.

2 Introduce the 6.1623.000 overflow protection into the M8 connector from below (second-smallest opening) of the bottle cap.

3 Place the bottle cap on the 6.1608.030 clear glass bottle (or on a different bottle with GL 45 thread) and screw it tightly.

4 Place the 6.1808.050 tubing olive in the M8 connector of the bottle cap and screw it tightly.

5 Plug the remaining piece of the 6.1801.120 PVC tubing onto the tubing olive.

6 Insert the 6.1446.090 stopper into the remaining opening on the bottle cap.

7 Introduce the short 6.1819.050 PTFE cannula into the opening of the stopper.

8 Insert a 6.1805.200 PTFE tubing with M8 connector into the opening of the stopper and screw it tightly.

2.4 Connecting a pump

Connecting tubings to the pump

The pump connectors of the 915 KF Ti-Touch are located on the rear of the instrument.

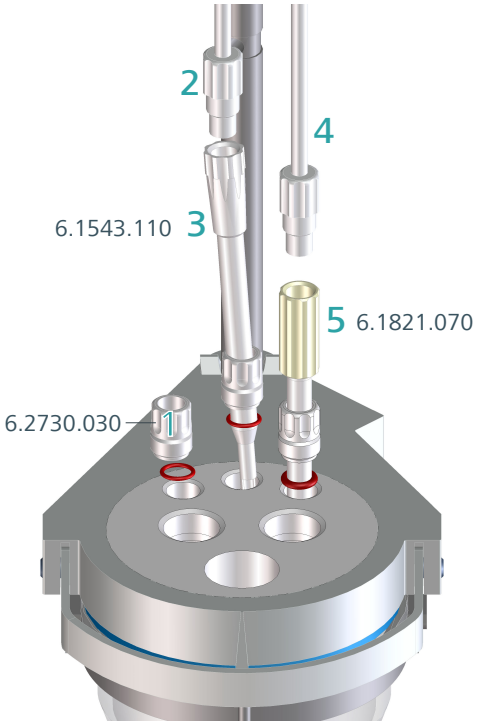
Take care to ensure that you connect the tubings to the pump correctly. Proceed as follows:

1 Fasten the 6.1801.120 PVC tubing from the aspiration bottle (clear glass) securely to the **Waste** connector (left-hand connector).

2 Fasten the 6.1801.120 PVC tubing from the solvent bottle (amber glass with adsorber tube) securely to the **Solvent** connector (right-hand connector).

2.5 Setting up tubings and tips

Setting up the aspiration and dosing tip



1 Place the three screw nipples 6.2730.030 (including O-rings, but without stoppers) in the rear openings of the vessel lid.

2 Screw the 6.1543.110 dosing tip onto the 6.1805.200 M8 PTFE tubing of the solvent bottle (amber glass).

3 Insert the dosing tip through the stopper in the middle rear opening of the vessel lid.

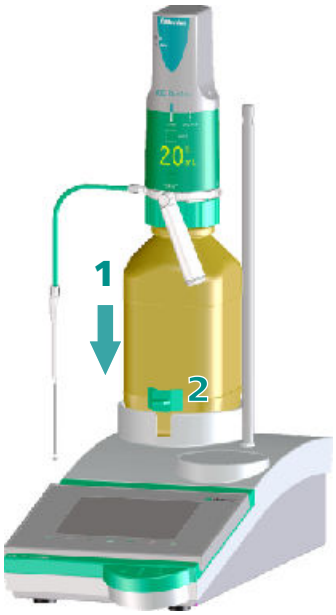
4 Screw the 6.1821.070 aspiration tip onto the 6.1805.200 M8 PTFE tubing of the aspiration bottle (clear glass).

5 Insert the aspiration tip through the stopper in the right rear opening of the vessel lid.

When solvent is aspirated, the end of the aspiration tip must touch the vessel base, but it must not inhibit the action of the stirring bar.

The aspiration tip can, if needed, be pulled out of the solvent.

Placing an 800 Dosino with dosing unit



NOTICE

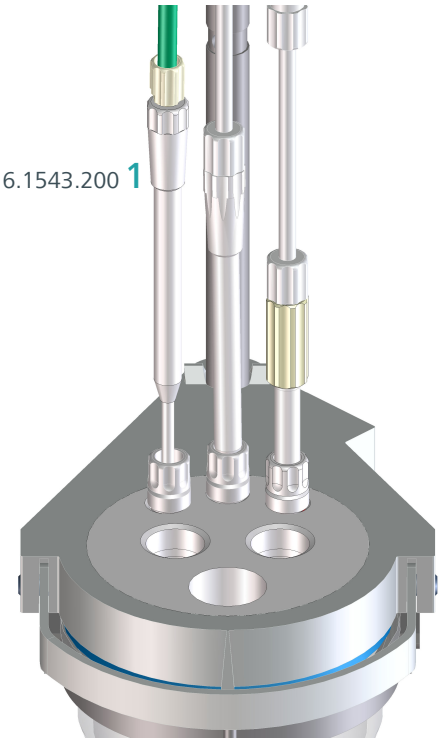
In the manual for the *807 Dosing Unit*, you will find information about assembling the dosing unit and mounting it on the bottle.

Make sure that the adsorber tube on the dosing unit equipped with molecular sieve is filled. This way the Karl Fischer reagent will be protected against incoming moisture.

1 Place the reagent bottle with *800 Dosino* and dosing unit in the bottle holder of the 915 KF Ti-Touch.

2 Mount the holding clamps 6.2043.005 on the bottle holder so that the reagent bottle is securely fastened in place.

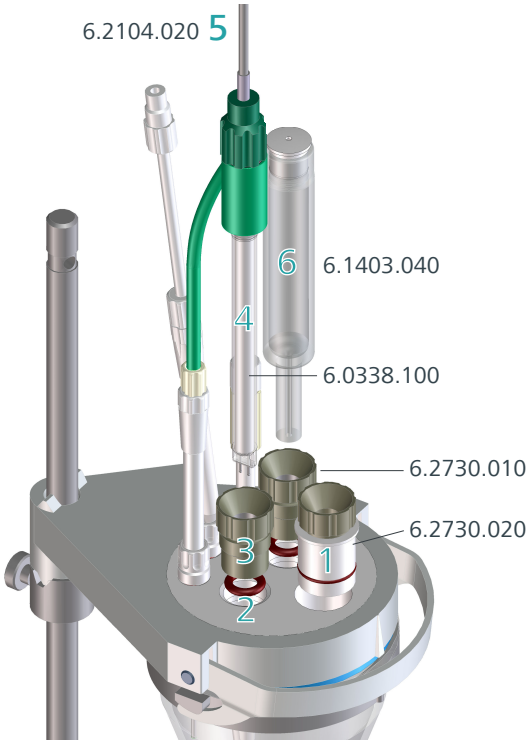
Inserting the buret tip



1 Insert the buret tip 6.1543.200 of the dosing unit into the remaining opening at the rear on the vessel lid.

The microvalve of the buret tip should be located just above the stirring bar, but should not be permitted to impede it.

2.6 Inserting electrode, adsorber tube and septum stoppers



Proceed as follows:

1 Introduce the 6.2730.020 septum stopper (with septum inserted) into the front opening of the vessel lid.

2 Insert the O-rings of the electrode and of the adsorber tube into the middle openings of the vessel lid.

3 Screw the two 6.2730.010 screw nipples into the openings with the O-rings. Do not screw too tightly.

4 Introduce the 6.0338.100 double Pt electrode into the left-hand opening and then tighten the screw nipple until it seals.

5 Screw the 6.2104.020 electrode cable tightly onto the electrode.

Make sure that the electrode cable 6.2104.020 is inserted at the rear of the device at the socket **"Pol."**.

6 Insert the filled 6.1403.040 adsorber tube on the right of the electrode into the remaining opening and then tighten the screw nipple until it seals.

3 Switching the instrument on and off and selecting the dialog language

3.1 Switching the instrument on and off

Switching on the instrument

CAUTION

Peripheral devices (e.g., printers) must be connected and switched on before you switch on the 915 KF Ti-Touch.

NOTICE

English is set as the default dialog language when the instrument is switched on for the first time.

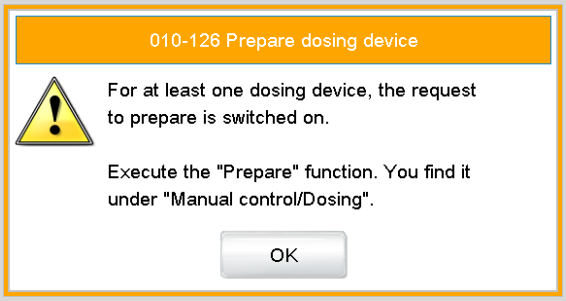
Information about changing the dialog language can be found in the following section.

Proceed as follows:

1 ▪ Press the power switch on the left-hand side of the back panel of the 915 KF Ti-Touch.
The 915 KF Ti-Touch is initialized. A system test is performed. This process takes some time.

NOTICE

If a buret unit is connected, then a request appears to carry out the **Prepare** function:

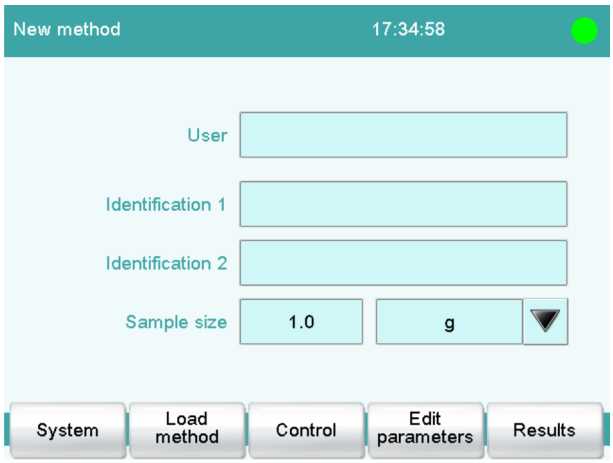


All tubings and the cylinder are rinsed with the **Prepare** function.

The preparing of the buret unit is described in the *Preparing buret unit* section later in the document.

- Confirm the message with **[OK]**.

The main dialog is displayed:



Switching off the instrument

CAUTION

The 915 KF Ti-Touch must be switched off by pressing the power switch on the rear of the instrument before the electricity supply is interrupted. If this is not done, then there is a danger of data loss.

Proceed as follows:

1 Press the power switch on the left-hand side of the back panel of the 915 KF Ti-Touch.

The current data is saved and the system is shut down. This process takes just a short time. At the same time, all other instruments connected to the 915 KF Ti-Touch via a USB cable are also being switched off.

3.2 Selecting the dialog language

The user interface is available in several languages. In addition to the two default dialog languages *English* and *German*, additional languages can be selected.

Proceed as follows to select the dialog language:

1 Opening the system settings

- In the main dialog, tap on **[System]**.
- Tap on **[System settings]**.

The **System / System settings** dialog is displayed.

2 Selecting the dialog language

- Tap on the **Dialog language** list box and select the desired language.

3 Saving the settings

- Tap on the fixed keys **[** ⇦ **]** or **[** ⌂ **]**.

The main dialog is displayed in the respective dialog language.

4 Fundamentals of operation

4.1 Touch-sensitive screen

The entire 915 KF Ti-Touch user interface is touch-sensitive. Simply touch a few of the buttons on the interface to learn how a touch-sensitive screen reacts. You can always return to the main dialog by touching **[** ⌂ **]**.

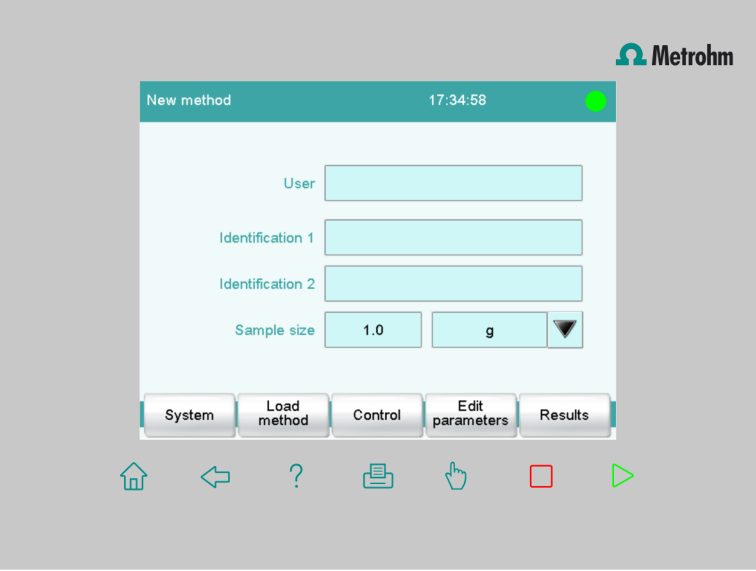
In order to activate an element on the 915 KF Ti-Touch user interface, just touch the screen with your fingertip, finger nail, the eraser of a pencil or a stylus (special tool for operating instruments with touch-sensitive screens).

CAUTION

Never touch the touch screen with a pointed or sharp object such as a ballpoint pen.

In the default setting, the software is configured in such a way that an acoustic signal will be generated every time an active control is touched. This setting can be deactivated in the system settings.

4.2 Display elements and controls



The following display elements and controls are available:

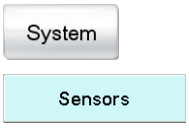
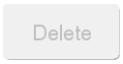
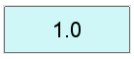
Table 1 Fixed keys which are always available

	[Home] always opens the main dialog.
	[Back] saves the entry and opens the next-higher dialog page.
	[Help] opens the online help for the dialog displayed.
	[Print] opens the printing dialog.
	[Manual] opens the manual control.
	[Stop] cancels the running determination.
	[Start] starts a determination.

The file name of the loaded method, the time and the system status are displayed in the main dialog in the **Title bar**.

In the other dialogs, the title bar shows the headings of the next upper level and of the displayed dialog. This is an aid for orientation during navigation through the user dialog.

Table 2 Screen elements

	**Buttons** open a new dialog when they are tapped.
	**Inactive buttons** with gray lettering indicate that the respective function is not available at the moment.
	**Input fields** open an input dialog when tapped.
	Tapping on the **selection symbol** opens a selection list.
	A **check box** can also be activated or deactivated by tapping on it.

4.3 Status display

The current status of the system is displayed in the upper right-hand corner of the title bar.

Table 3 Status displays

	The instrument is in normal status.
	The working medium is being conditioned.
	Conditioning has been paused.
	The working medium is conditioned.
	A method has been started.
	A method has been paused.
	An action has been started in manual control.

4.4 Entering text and numbers

In the editing dialog for text or numerical input, enter the individual characters by tapping in the input field. The following functions are available:

Text editor

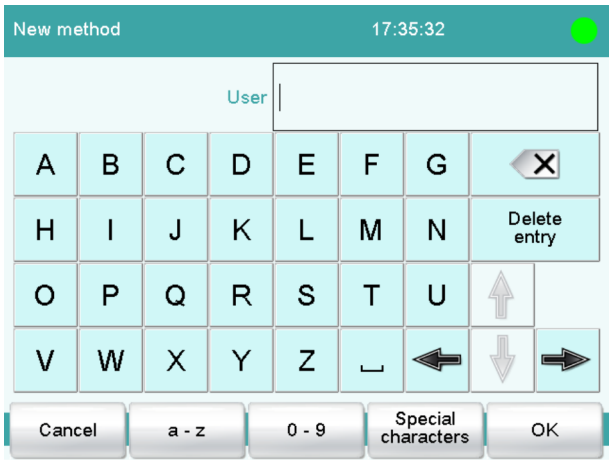


Table 4 Editing functions

[OK]	The modification is applied and the editing dialog is exited.
[Cancel]	The editing dialog is exited without applying the modification.
[Delete entry]	The content of the input field is deleted completely.
[⌫]	The character in front of the cursor is deleted.
[⇦]	The cursor within the input field is shifted to the left by one character.
[⇨]	The cursor within the input field is shifted to the right by one character.
[a…z]	The lower-case letters are displayed. The label changes to **[A…Z]**. The upper-case letters are displayed again by tapping.
[0…9]	Numbers and mathematical characters are displayed.
[Special characters]	Special characters are displayed. You can use the button **[More]** to navigate through all available characters.

Number editor

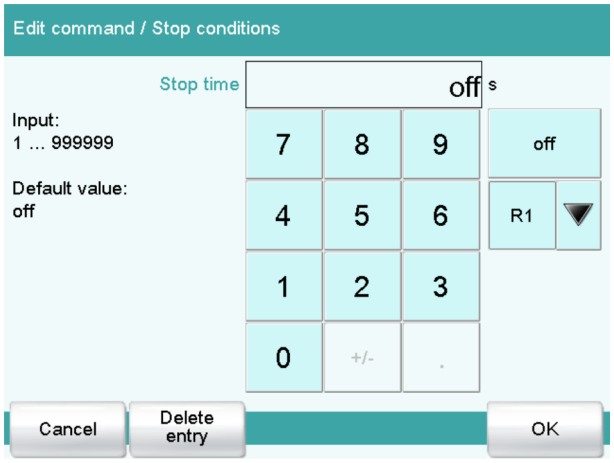


Table 5 Editing functions

[OK]	The modification is applied and the editing dialog is exited.
[Cancel]	The editing dialog is exited without applying the modification.
[Delete entry]	The content of the input field is deleted completely.
[off]	If not only numbers but also special values (e.g., **off**) can be entered, then the corresponding buttons will be shown to the right of the numerical keypad.
[R1]	For many parameters, a result previously defined in the method can also be entered in place of a number. You will find precise information concerning this in the Appendix of the detailed manual. You can select the result variable by touching **[R1]**.

NOTICE

A commercially available USB keyboard can be connected to make text and numerical input easier.

The key assignment is described in the chapter *Device manager* of the detailed manual.

5 Setup and configuration

5.1 Preparing devices and material

What you will need:

- One 915 KF Ti-Touch with mounted support rod and clamping ring
- One intelligent dosing unit (IDU) with a drive of the type *800 Dosino*
  or
  One intelligent or non-intelligent exchange unit (IEU or EU) with an *805 Dosimat*
- One Double Pt wire electrode with connection cable
- One Karl Fischer titration cell with necessary accessories
- Titrant, e.g. Composite 5 (or Titrant 5)
- One solvent bottle, e.g. with methanol (or KF solvent, respectively) with the necessary accessories
- One aspiration bottle with the necessary accessories
- Dosing, aspiration and buret tips
- Tubing connections between pump and aspiration/solvent bottle
- A USB printer with connecting cable, in case you wish to print out reports
- An analytical balance
- A water standard for the titer determination, e.g. 10 mg/g

5.2 Configuring a new titrant

You can have all of your titrants and auxiliary solutions be managed by the Ti-Touch. This has the advantage that the relevant data for these solutions (e.g. the titer) can be calculated and monitored automatically.

NOTICE

A brand-new, intelligent buret unit must be attached before carrying out the instructions listed below. In other words, the data chip may not yet contain any titrant data.

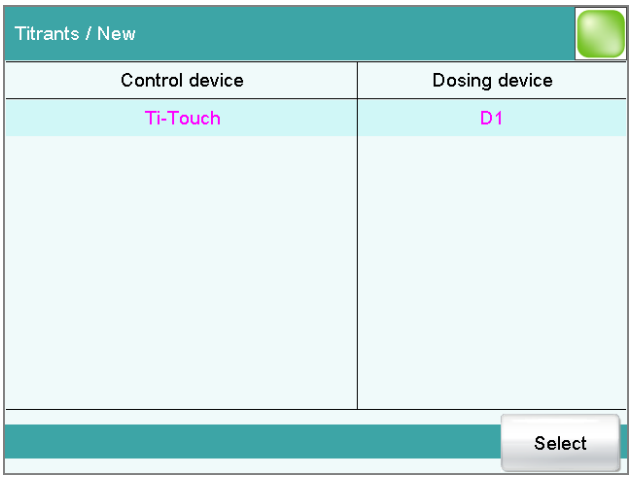
The solutions are configured under **System ▸ Titrant**.

Proceed as follows:

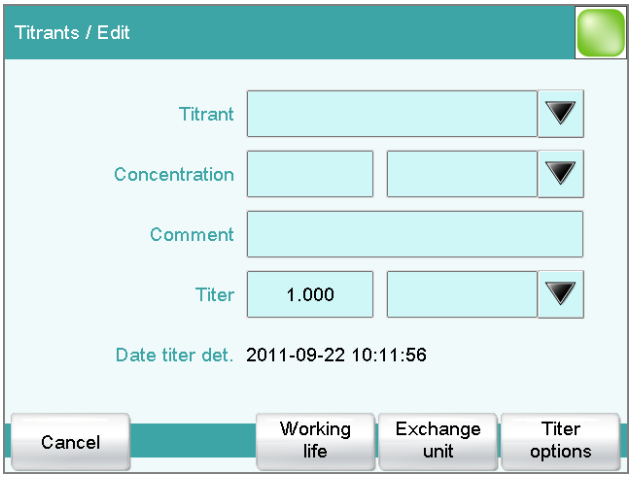
1 Opening the titrant list

- In the main dialog, tap on **[System]**.

- Tap on **[Titrant]**.
- Tap on **[New]**.
  You will now see an entry which depicts the attached buret unit.



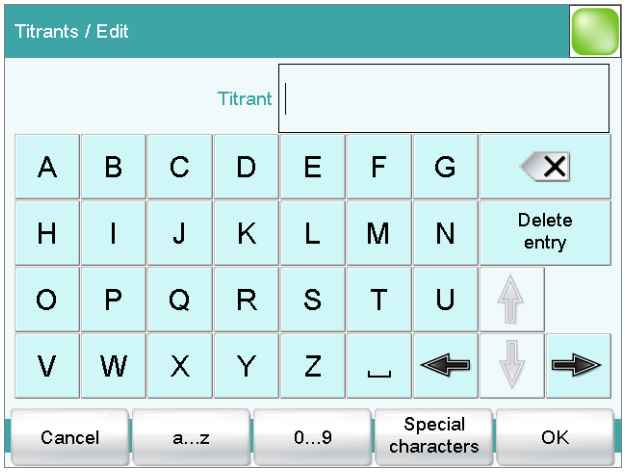
- Tap on **[Select]**.



2 Entering the titrant data

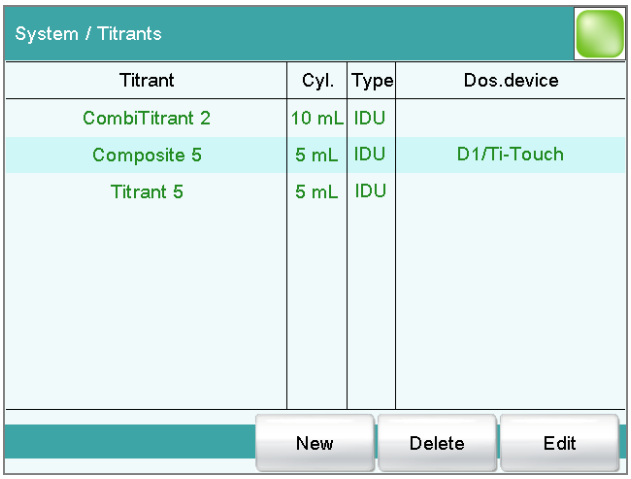
You can now enter the necessary data for the titrant. Each of the buttons with the selection symbol opens selection lists with useful suggestions.

- Tap on the input field **Titrant**.



- Enter a name for the titrant.
- Confirm the entry with **[OK]**.
- Enter additional data, e.g. a comment.
  The detailed 915 KF Ti-Touch manual contains additional information regarding the settings which can be specified for titrants.

The new titrant has been entered in the list. The cylinder size and the type of the buret unit are displayed. In the **Dos.device** column can be seen whether or not and at which connector and instrument the titrant is attached.



NOTICE

If the types **IDU** (intelligent dosing unit) and **IEU** (intelligent exchange unit) are used, then data can be applied directly from the data chip.

The type **EU** (nonintelligent exchange unit) possesses no data chip. In this case, you can create the titrant yourself by tapping on **[New]**.

3 Return to the main dialog with the **[⌂]** fixed key.

5.3 Configuring a new sensor

You can have all of your sensors be managed by the 915 KF Ti-Touch. This has the advantage that the relevant data for these sensors (e.g., the working life) can be monitored automatically.

The sensors are configured under **System ▸ Sensors**.

Proceed as follows:

1 **Opening the sensor list**

- In the main dialog, tap on **[System]**.
- Tap on **[Sensors]**.
- Select **Metal electrode**.
- Tap on **[Edit]**.

2 **Entering the sensor data**

You can now enter additional data for the sensor, e.g., the order or serial number.

3 Return to the main dialog with the **[⌂]** fixed key.

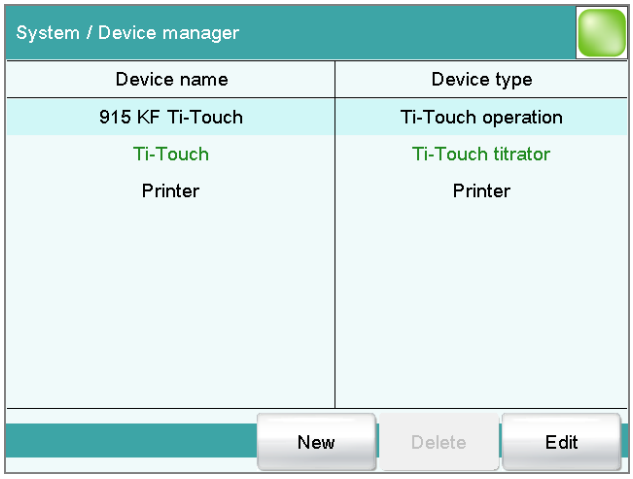
5.4 Configuring a printer

If you wish to print out results and titration curves, then you must configure the printer in the device manager.

Proceed as follows:

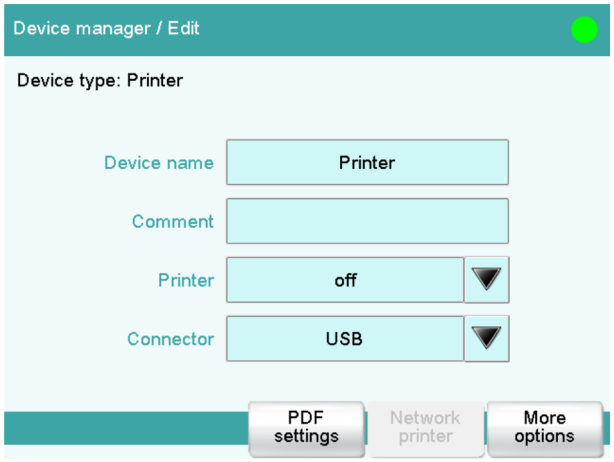
1 Opening the printer dialog

- In the main dialog, tap on **[System]**.
- Tap on **[Device manager]**.



2 Entering the printer data

- Select **Printer** and tap on **[Edit]**.



- Tap on the selection symbol next to the input field **Printer** and select a printer type.
- Once you have connected a USB printer, tap on the selection symbol next to the input field **Connector** and select **USB**.

- If you would like to use a printer in your company network, tap on the selection symbol next to the input field **Connector** and select **Ethernet**.
  You will find information as to how you connect your Ti-Touch to your company network and which settings are necessary under **Network printer** in the *Device manager* chapter contained in the detailed manual.

3 Return to the main dialog with the **[** ⌂ **]** fixed key.

NOTICE

You can also compile reports as PDF files and store them on a USB flash drive or on a shared data directory in your company network.

You will find information as to which settings are necessary for releasing a data directory in the *Device manager* chapter contained in the detailed manual.

6 Carrying out a Karl Fischer titer determination

6.1 Creating a method for titer determination

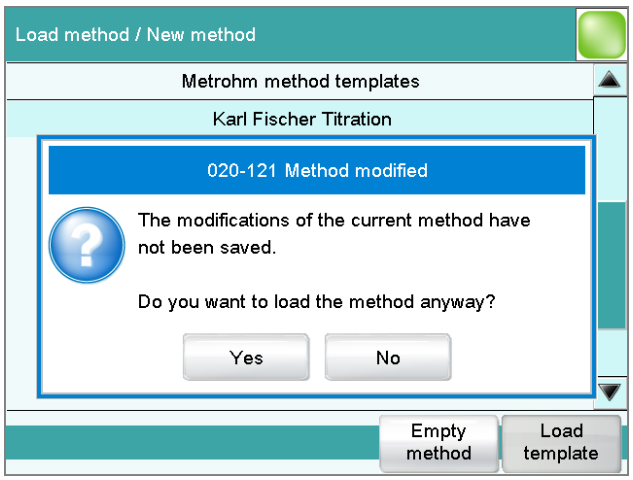
Below you will find a description of how to create your own method for titer determination. The Ti-Touch contains method templates which are already configured except for a few parameters.

The titer of the reagent should be determined by a fivefold determination of a water standard. If you have a printer connected, then a report with the result and the curve should be printed out automatically at the end of each determination.

Proceed as follows:

Loading a method template

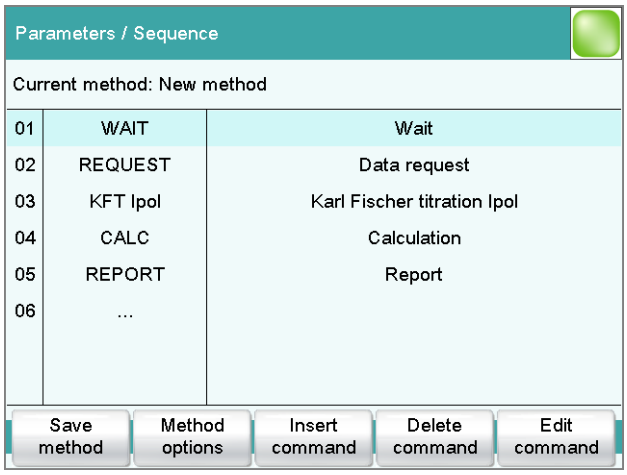
1
- In the main dialog, tap on **[Load method]**.
- Tap on **[New method]**.
  The method table with the stored templates is opened.
- Select the template **Karl Fischer titration**.
- Tap on **[Load template]**.
- Confirm the following message with **[Yes]**.



Adjusting method parameters

1 In the main dialog, tap on **[Edit parameters]**.

The command sequence of the loaded method is displayed.



2 Selecting a Karl Fischer command

- Highlight the line **KFT Ipol**.
- Tap on **[Edit command]**.
  A selection of parameters (e.g. start conditions) and instruments (e.g. dosing devices, see next step) appears, which can be selected and adjusted individually.

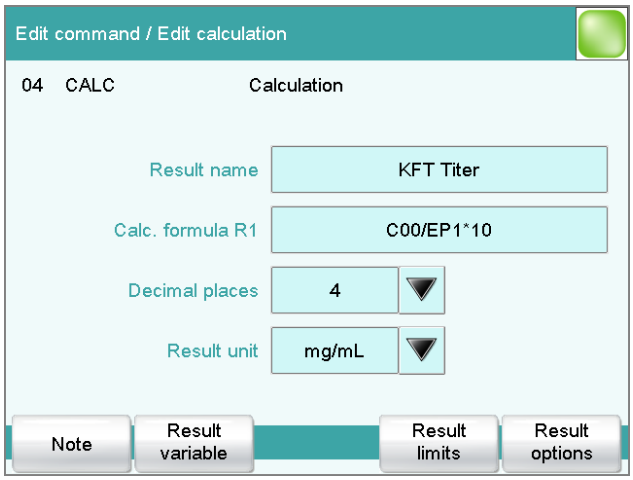
3 Selecting the titrant

- Tap on **[Dosing device]**.
- Make sure that the correct MSB connector (1 or 2) is selected under **Dosing device**.
- Select the previously configured titrant under **Titrant**.
- Confirm with the **[⇦]** fixed key.

4 Adjusting the calculation

- Return to the command sequence with the **[⇦]** fixed key.
- Select **CALC**.
- Tap on **[Edit command]**.
- Tap on **[New]**.
  A selection of templates appears.
- Select the template **KFT Titer**.
- Tap on **[Load template]**.
  The request appears to enter the water content of the standard solution under **F1**.
- Tap on **[Continue]**.
- Enter the water content of the standard solution in **mg/g**.

- Tap on **[Continue]**.
  The dialog with the calculation formula appears.



- Under **[Result options]**, ensure that the selection **Mean value** is set for the parameter **Save as titer**.
  This ensures that the mean value of the results in the configured titrant is saved as the titer.
- Return with the **[⇦]** fixed key to the command sequence of the method run.

5 Adjusting the report options

In the default settings, one **Result report** and one **Curve** are defined in the report options. You can adjust these parameters as needed and supplement them with additional reports. More precise information concerning this can be found in the more detailed manual.

NOTICE

If you have not connected a printer, delete the command **REPORT**. If this is not done, then an error message will appear at the start of the determination.

6 Activating the statistics

- Tap on **[Method options]**.
- Activate the **Statistics** check box.
- Set the parameter **Number of determinations** to **5**.

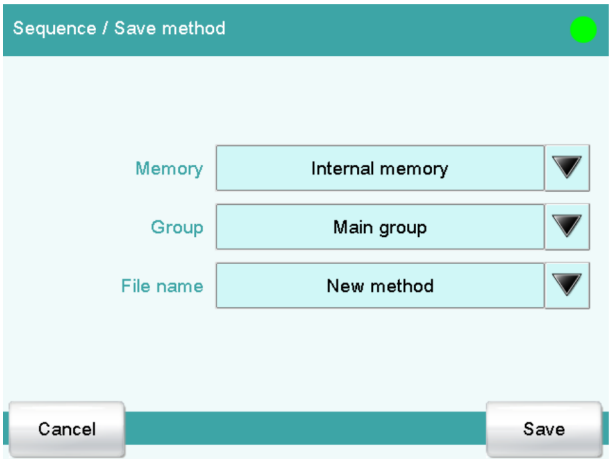
NOTICE

Under **[Save automat.]**, you can also save the determination as determination file (MDTM file) and as PC/LIMS report (TXT file) *(see chapter 8.1, page 50)*.

- Return with the **[⇦]** fixed key to the command sequence of the method run.

7 Saving a method

- Tap on **[Save method]**.



You can save the method in the instrument's internal memory, on a USB storage medium or in a shared data directory in a network. In addition, you can also create different groups and/or folders for the methods.

- Tap on the input field **File name**.
- Enter a name for the method.
- Confirm the entry with **[OK]**.
- Tap on **[Save]**.
  The method is stored in the "Main group" folder.
- Return to the main dialog with the **[⌂]** fixed key.

6.2 Preparing the buret unit

The **[Prepare]** function is used to rinse the cylinder and tubings of the buret unit and fill them bubble-free. You should carry out this function before the first determination or once per day.

Proceed as follows:

1 Tap on the manual control key **[ ]**.

2 Tap on **[Dosing]**.

NOTICE

Make sure that the buret tip in the KF titration cell is mounted so that the reagent is dosed into the closed titration cell.

3 Tap on **[Prepare]**.

A splash warning will be displayed.

4 Confirm with **[Yes]**.

The preparing is carried out with permanently set parameters (see detailed manual).

6.3 Carrying out a titer determination

Conditioning the titration cell

Make sure that the titration cell is empty. If necessary, press the button on the right at the front on the Ti-Touch in order to empty the titration cell.

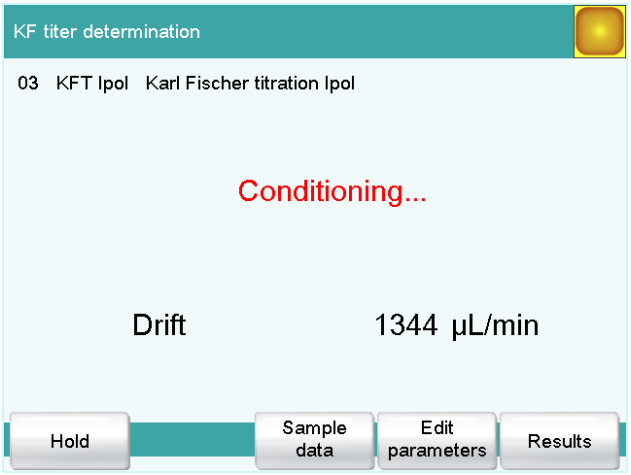
1 **Add solvent into the titration cell**

Press the button on the left at the front of the device until approx. 20 mL of methanol (or KF solvent, respectively) are in the titration cell.

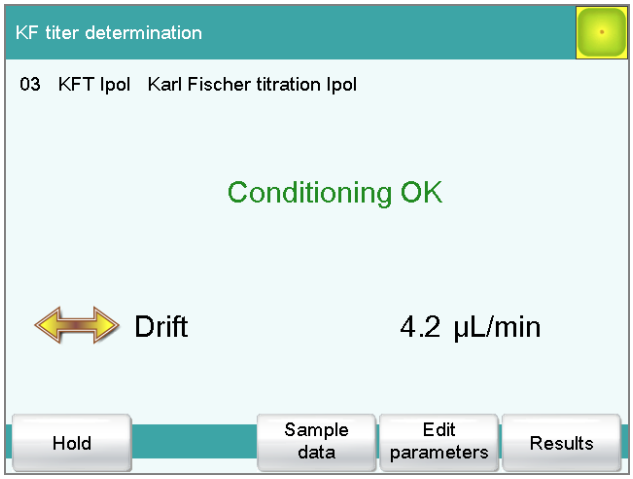
2 **Start conditioning**

Tap on the start key **[ ]**.

The following dialog is displayed until the endpoint is reached.



When the endpoint is reached, this will be displayed by the following dialog. The status is kept stable.



Rinsing the syringe

1. Fill a little water standard (approx. 1 mL) into a syringe with a long needle.

   Make sure that the piston of the syringe is pulled all the way to the back while accomplishing this.

2. Eject the water standard into a waste container.

Injecting water standard

1

NOTICE

Calculate the amount of the water standard in such a way that a titration consumption of 10…90 % of the cylinder volume will result.

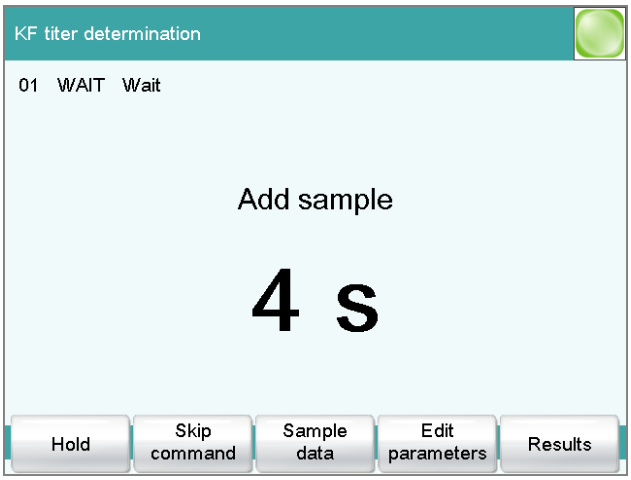
Draw the water standard into the syringe.

Make sure that there are no air bubbles in the syringe.

2 Tare the balance with the filled syringe and then remove the syringe from the balance once again.

3 Tap on the start key **[▷]**.

Conditioning is stopped. The request for adding the water standard will be displayed for 6 s.



4 Inject the water standard through the septum into the titration cell during the specified time.

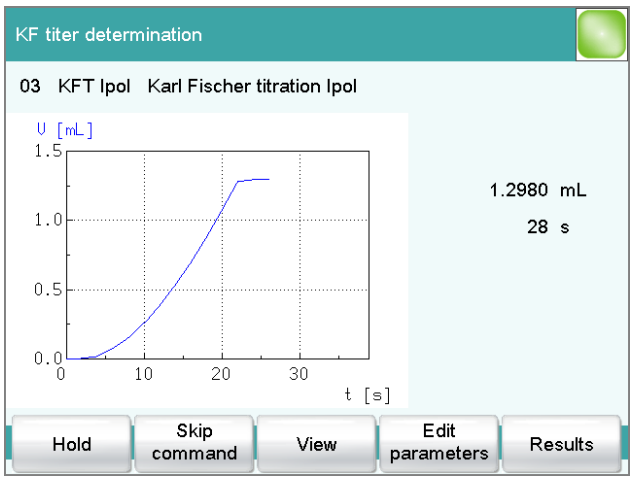
Take care to ensure that the needle of the syringe is immersed in the solution while injecting the water standard.

Starting the titration

1 Reweigh the syringe in order to determine the sample size.

2 Enter the sample size in grams (g) and confirm with **[Continue]**.

The titration curve is shown live.



After the completion of the titration, the results dialog is displayed. If a printer is connected, then the result report and the titration curve will now be printed out.

Conditioning is restarted automatically in the background.

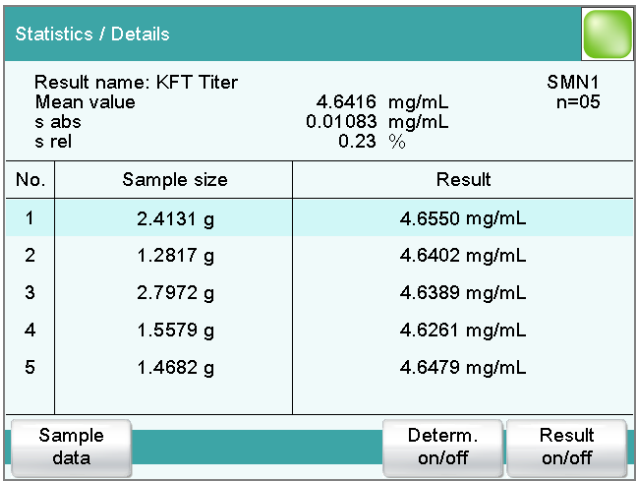
3 Carry out the four remaining titer determinations in the same way.

Showing the statistics data

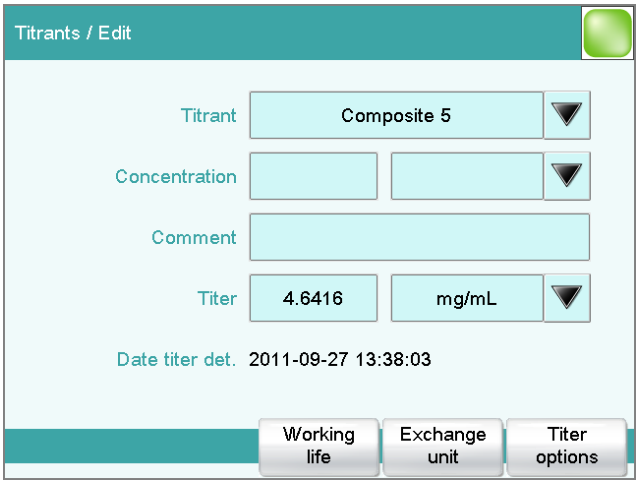
1 After the last titer determination, tap on **[Statistics]**.

2 Tap on **[Details]**.

The statistical overview is shown. The mean value, the absolute and the relative standard deviation are displayed. For the mean value, the number of individual results from which it has been calculated is displayed.



The calculated mean value is assigned automatically to the titrant as the titer. You will find this under **System ▸ Titrants ▸ Edit**.



7 Carrying out the water content determination of a sample

7.1 Creating a titration method

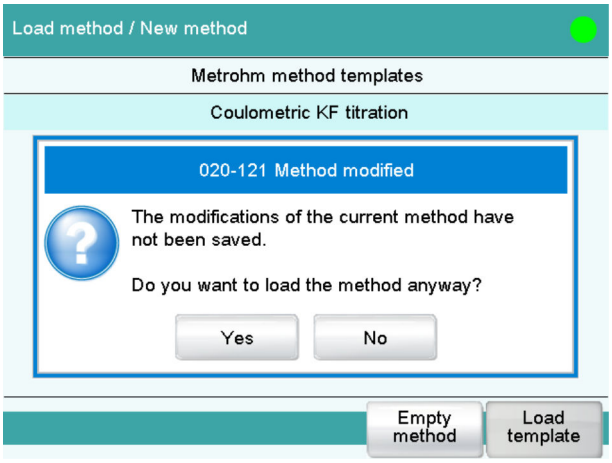
Below you will find a description of how to create your own method for water content determination. The 915 KF Ti-Touch contains method templates which are already configured except for a few parameters.

The water content of a sample should be determined by means of a triple determination. If you have a printer connected, then a report with the result and the curve should be printed out automatically at the end of each determination.

Proceed as follows:

Loading a method template

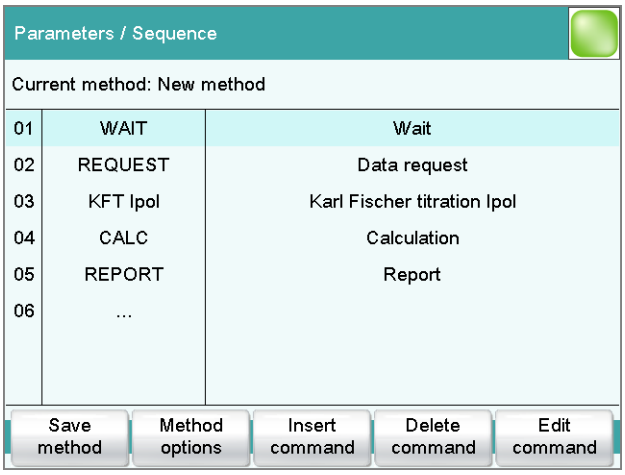
1
- In the main dialog, tap on **[Load method]**.
- Tap on **[New method]**.
  The method table with the stored templates is opened.
- Select the template **Karl Fischer titration**.
- Tap on **[Load template]**.
- Confirm the following message with **[Yes]**.



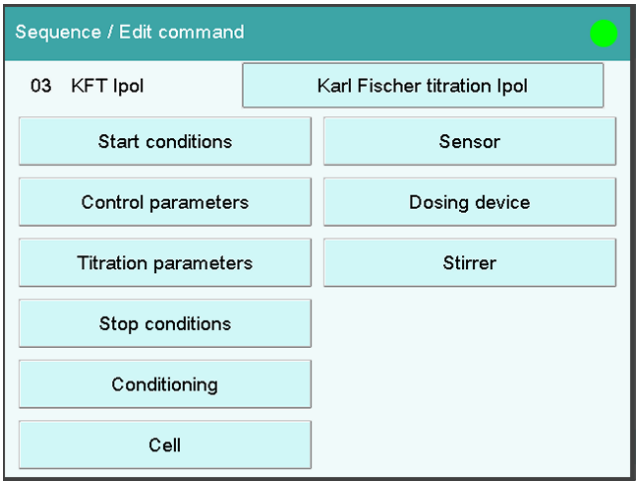
Adjusting method parameters

1 In the main dialog, tap on **[Edit parameters]**.

The command sequence of the loaded method is displayed.



2 Selecting a Karl Fischer command



- Highlight the line **KFT Ipol**.
- Tap on **[Edit command]**.
  A selection of parameters (e.g. start conditions) and instruments (e.g. dosing devices, see next step) appears, which can be selected and adjusted individually.

3 Selecting the titrant

- Tap on **[Dosing device]**.
- Make sure that the correct MSB connector (1 or 2) is selected under **Dosing device**.
- Select the previously configured titrant under **Titrant**.
- Confirm with the **[⇦]** fixed key.

4 Adjusting the calculation

- Select **CALC**.
- Tap on **[Edit command]**.

- Tap on **[New]**.
  A selection of templates appears.
- Select e.g., the template **KFT content (%)**.
- Tap on **[Load template]**.
- Confirm the subsequent note with **[Next]**.
- Under **[Result options]**, ensure that the selection **SMN1** is set for the parameter **Variable for mean value**.
  This ensures that the mean value of the results is calculated.

NOTICE

The calculation is carried out continuously, i.e. the calculation is updated after every determination that is carried out until the defined number of determinations has been reached.

- Under **[More options]**, define parameters, e.g., **Save result in result table**.
  See the detailed manual for precise information.
- Return with the **[⇦]** fixed key to the command sequence of the method run.

5 Adjusting the report options

In the default settings, **Result report** and **Curve** are defined in the report options.

Adjust these parameters as needed and supplement them with additional reports.

See the detailed manual for precise information.

NOTICE

If you have not connected a printer, delete the command **REPORT**. If this is not done, then an error message will appear at the start of the determination.

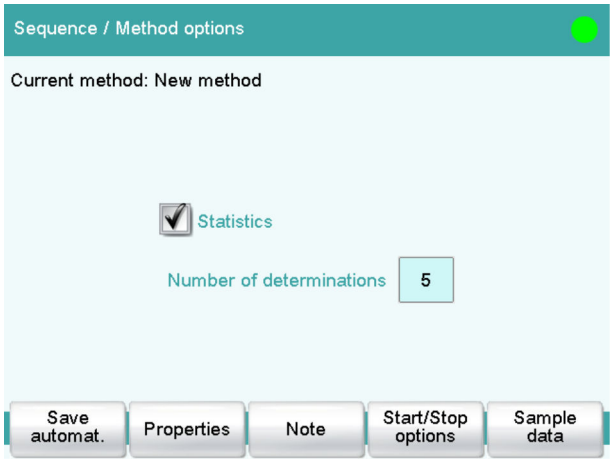
6 Adjusting additional method parameters

If necessary, adjust parameters in the **KFT Ipol** command such as pauses (under **[Start conditions]**) or the extraction time (under **[Titration parameters]**).

See the detailed manual for precise information.

7 Activating the statistics

- In the main dialog, tap on **[Edit parameters]**.
- Tap on **[Method options]**.



Here you can define the statistics function for this method. You can specify the number of determinations for which the respective statistical calculations are to be carried out.
These settings apply for all determinations which are carried out with this method.

- Tap on the check box **Statistics**.
- Enter a value under **Number of determinations**.

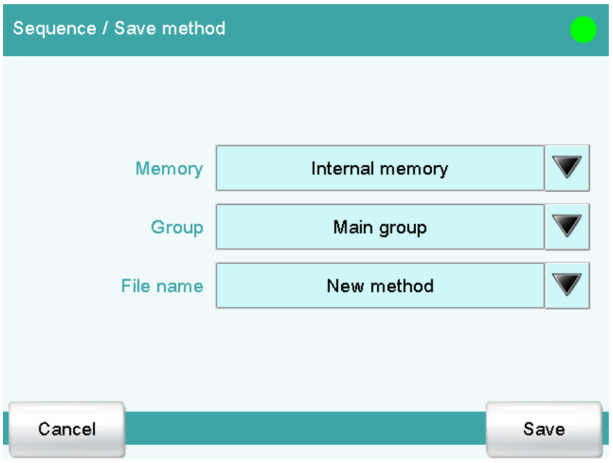
NOTICE

Under **[Save automat.]**, you can also save the determination as a determination file (MDTM file) and as a PC/LIMS report (TXT or UTF8 file) *(see chapter 8.1, page 50)*.

- Tap on the fixed key **[⇦]**.

8 **Saving a method**

- Tap on **[Save method]**.



You can save the method in the instrument's internal memory, on a USB storage medium or in a shared data directory in a network. In addition, you can also create different groups and/or folders for the methods.

- Tap on the input field **File name**.
- Enter a name for the method.
- Confirm the entry with **[OK]**.
- Tap on **[Save]**.
  The method is stored in the folder selected in the **[Group]** input field. **Main group** is selected by default.
- Return to the main dialog with the **[** ⌂ **]** fixed key.

7.2 Carrying out the water content determination

You can use either the methanol (or the KF solvent, respectively) from the previous titer determination or fresh methanol (or KF solvent, respectively).

Conditioning the titration cell

If you are using fresh methanol (or KF solvent, respectively), make sure that the titration cell is empty. If necessary, press the button on the right at the front on the Ti-Touch in order to empty the titration cell.

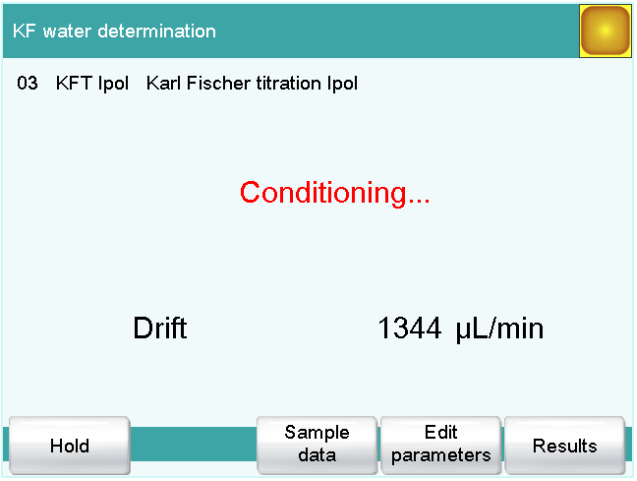
1 **Adding solvent into the titration cell**

Press the button on the left at the front of the device until approx. 20 mL of methanol (or KF solvent, respectively) are in the titration cell.

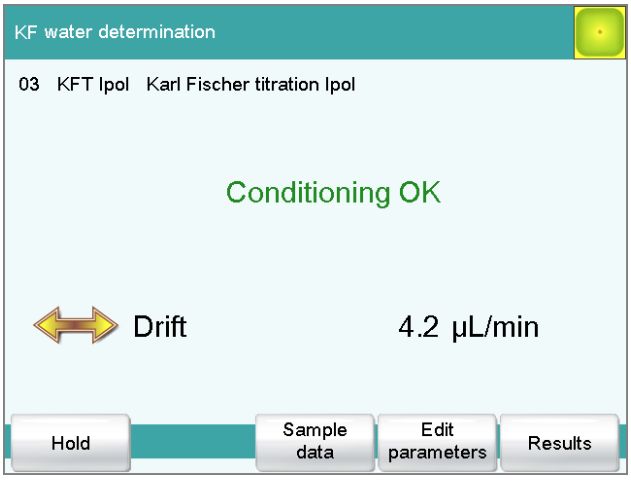
2 Starting conditioning

Tap on the start key **[▷]**.

The following dialog continues to be displayed until the status **Conditioning OK** is achieved, i.e. until the titration cell has been titrated dry.



The water seeping in is titrated off continuously (basic drift).



Entering sample data in the main dialog

1 Entering sample identification and sample size

- Tap on the input field **Identification 1**.
- Enter a designation for the sample (e.g., type of sample or an analysis number).
- Tap on the input field **Identification 2**.

- Enter a further designation for the sample (e.g., batch number or sampling date).

NOTICE

Which balance you can connect and how you configure this balance can be found in the detailed manual.

Adding sample

1 **NOTICE**

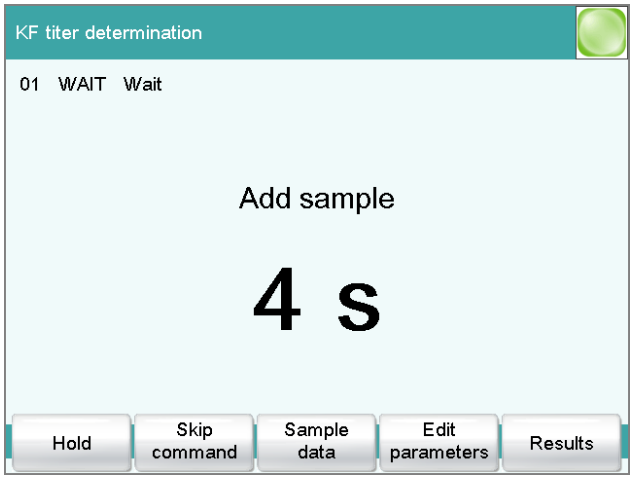
Calculate the amount of the sample in such a way that a titrant consumption of 10…90% of the cylinder volume will result.

Prepare the sample for adding into the titration cell.

2 Tare the balance with the prepared sample and then remove the sample from the balance once again.

3 Tap on the start key **[▷]**.

Conditioning is stopped. The request for adding the sample will be displayed for 8 s.

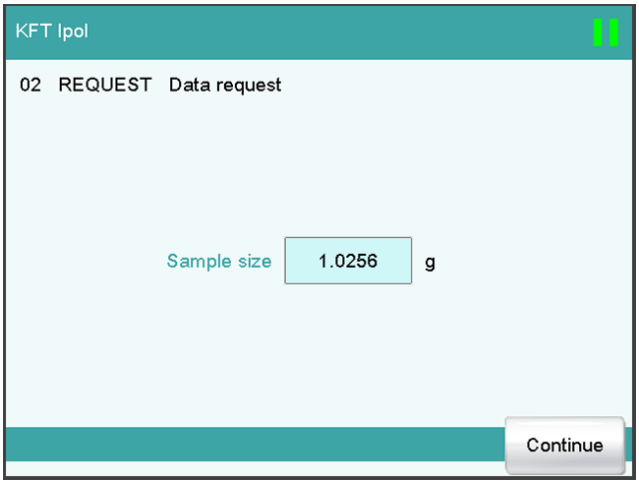


4 Introduce the sample into the titration cell during the specified time.

Starting the titration

1 Reweigh the sample in order to determine the sample size.

2
- Enter the sample size and confirm with **[Continue]**.



NOTICE

The sample size can also be adopted directly from a connected balance.

Which balance you can connect and how you configure this balance can be found in the detailed manual.

- The titration curve is shown live.
  After the completion of the titration, the results dialog is displayed. If a printer is connected, then the report defined in the method will be printed out.
  Conditioning is restarted automatically in the background.

3 Carry out the two remaining water content determinations in the same way.

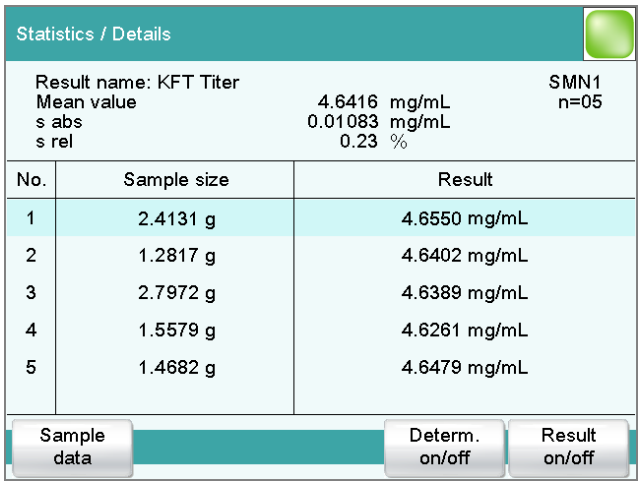
If the statistics function is activated, you can have the statistics data displayed after the titration. Proceed as follows:

1 **Opening the statistics page**
- In the main dialog, tap on **[Results]**.
- Tap on **[Statistics]**.

The mean value of the result is displayed in the statistical overview.

2 Displaying statistics data

Tap on **[Details]**.



In the upper part of the display you will see the mean value of the result as well as the absolute and the relative standard deviation. The single results of the titrations are listed in a table.

If you would like to exclude a titration from the statistical calculation, you can select it and then tap on **[Result on/off]** or **[Determ. on/off]**. The recalculation of the statistics data will be performed immediately.

If you would like to add other titrations to the statistics, you can do this in the statistical overview.

8 Performing titration with supplementary functions

8.1 Saving the determination and the PC/LIMS report

You can have the determination data (measuring point list, results etc.) of a titration which has been carried out saved automatically. This makes it possible to reprocess or print out this data later. You can save the determinations to a USB storage medium or to a drive in a computer network.

If you would like to manage the determination data in a database on a PC, then you can save it in a report called PC/LIMS report or transfer it directly to a PC through a serial connection.

PC/LIMS reports can be saved either as TXT file (in accordance with ISO 8859-1) or UTF8 file.

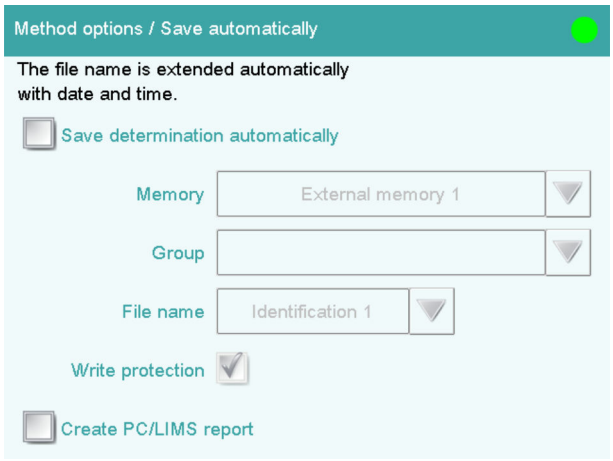
The **tiBase** database software from Metrohm is available to you for administering the determination data on the PC.

Defining the automatic saving

Proceed as follows:

1 Opening the method options

- In the main dialog, tap on **[Edit parameters]**.
- Tap on **[Method options]**.
- Tap on **[Save automat.]**.



2 Activating Save determination and defining the memory location

- Activate the **Save determination automatically** check box.
- Select the memory location under **Memory**. You can choose between **External memory 1** (e.g., a USB flash drive) or **Shared memory** (memory location in a computer network).
  A USB flash drive (external memory 1) must be plugged in on the 915 KF Ti-Touch before a determination is carried out. This memory location must already be defined in the device manager at the time of the selection of a shared memory location in a computer network. Before a determination is carried out, the 915 KF Ti-Touch must be connected to the network with an Ethernet cable.
- Tap on the selection symbol next to the input field **Group** and select an existing group or create a new group.
  The determination data can be stored on the storage medium in various groups (= folders on the storage medium).
- Define the designation for the file name.
  Two sample identifications or the method name are available for selection. If you tap on the input field **File name**, then you can enter a designation of your own for the file name.
- Activate or deactivate **write protection**.
  You can protect the original determination data against overwriting.

3 Activating the PC/LIMS report and defining the memory location

- Activate the **Create PC/LIMS report** check box.
  Define the memory location for the PC/LIMS report in the device manager.
- Return to the main dialog with the **[** ⌂ **]** fixed key.

NOTICE

These settings are method-specific. The determination data is saved to the defined memory location for all determinations which are carried out with this method. You can define different memory locations for your methods.

NOTICE

The settings for the PC/LIMS report (memory, RS-232, coding) must be undertaken in the "Edit instrument/PC/LIMS report" dialog.

8.2 Modifying the titration parameters

You can optimize a titration run by modifying individual titration parameters according to the needs of your analysis. For the following titration, the stirring rate, the extraction time and the start drift are being modified.

Setting the stirring rate

1 Opening the stirrer settings

- In the main dialog, tap on **[Edit parameters]**.
- Select the **KFT Ipol** command and tap on **[Edit command]**.
- Tap on **[Stirrer]**.

2 Modifying the stirring rate

- Tap on **[–]** or **[+]** to modify the stirring rate.
  You can use the check box **Switch off automatically** to set whether or not the stirrer is switched off at the end of the titration.
- Use the **[⇦]** fixed key to return to the **KFT Ipol** command.

NOTICE

Thorough mixing is important with volumetric titration.

We recommend a Stage 8 stirring rate or Stage 15 when used in combination with an oven.

Modifying the settings for the titration

1 Setting an extraction time

NOTICE

The input of an extraction time is recommended, e.g., with samples that release water slowly or if a Karl Fischer oven (e.g., *885 Compact Oven SC*) is used. The extraction time corresponds to the minimum duration of the titration.

Please note, however, that the titration will be canceled if you have, for example, defined a stop volume under **[Stop conditions]** that is achieved before the extraction time has run through.

- Tap on **[Titration parameters]**.
- Under **Extraction time**, enter the desired time.
  Use the **[⇦]** fixed key to return to the **KFT Ipol** command.

2 Modifying the start drift

- Tap on **[Conditioning]**.
- Under **Start drift**, enter the desired value.
- Define additional stop parameters under **[Cond. options]**.
  Conditioning will be canceled if one of the stop parameters set here is achieved before the start drift is reached.

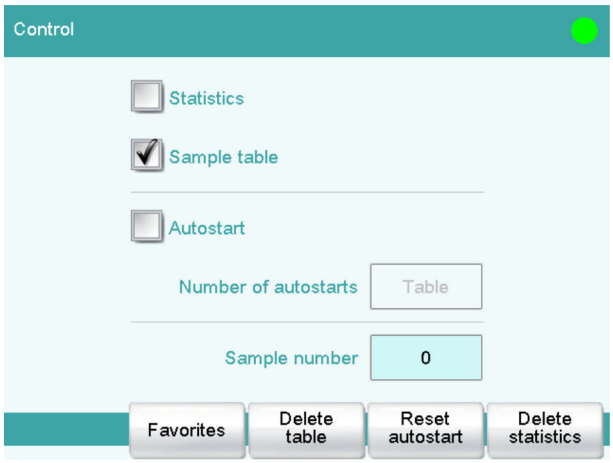
8.3 Creating a sample table

If you would like to prepare a sample series in advance, you can use the sample table. Proceed as follows:

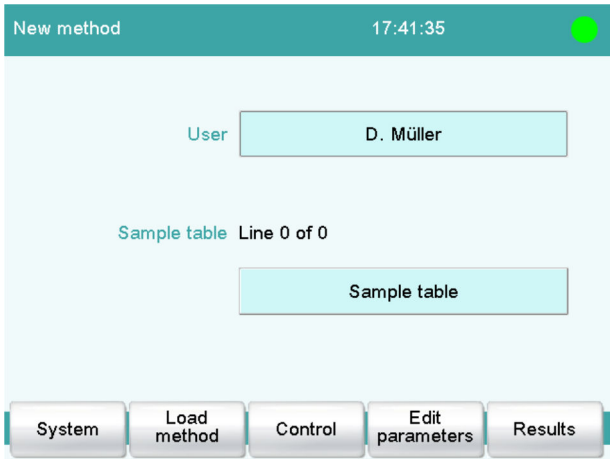
Filling the sample table with sample data

1 Activating the sample table

- In the main dialog, tap on **[Control]**.

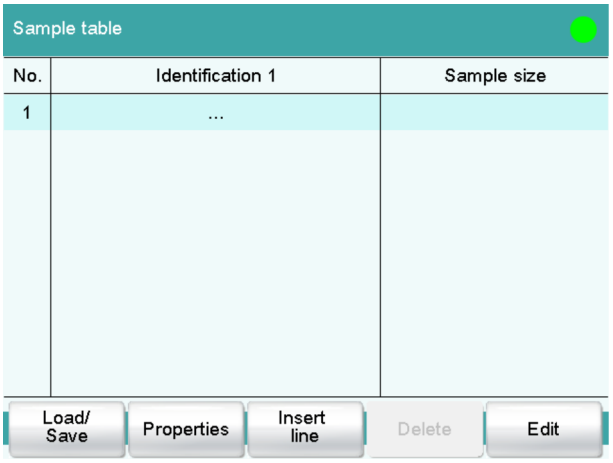


- Activate the **Sample table** check box.
- Return to the main dialog with the **[⇦]** fixed key.
  A new button is now visible in the main dialog.



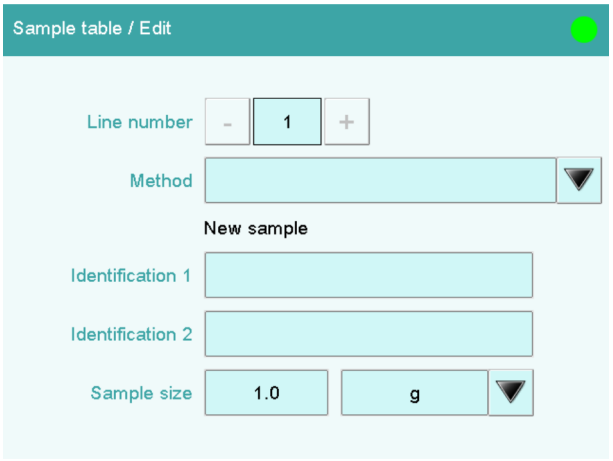
2 Entering the sample data

- Tap on **[Sample table]**.



The sample table is still empty. The first line is highlighted.

- Tap on **[Edit]**.



- Tap on the selection symbol next to the input field **Method**.
- Select a saved method.
  A particular method can be selected for each sample which is to be processed. If no method is specified, then the currently loaded method is executed.

- Fill out the fields for sample identification and the sample size. The line number is automatically increased by one after the sample size has been entered. The next sample size can be entered directly.
  The criterion, after which the line number should be increased by one, can be modified in the properties dialog of the sample table under **[Editing options]**.

- Use the **[** ⇦ **]** fixed key to return to the sample table.
- Switch to the main dialog with the **[** ⌂ **]** fixed key after the desired number of sample data has been filled in.

8.4 Carrying out titrations using the sample table

Now carry out the titrations with the samples for which you have entered sample data.

Each time that you press the **[** ▷ **]** fixed key, the sample data will be loaded from the top line of the sample table and applied for the current titration. This line will be deleted at the end of the titration. The sample data of the next line down will be used for the next titration.

A result report will be printed out and a PC/LIMS report will be saved after each titration if you have defined or activated these options.

NOTICE

The sample table can also be used with automated determinations.

9 Setting up the user administration

If different persons are working on the instrument, we recommend that the user administration of the 915 KF Ti-Touch be used. This means that everyone can use their user identification to log on to the instrument. The reports will then automatically contain the respective user name.

In addition, a dialog level can be set up for each user. In addition to the expert dialog, with access to all functions and settings, a routine dialog can be selected with limited access rights. The available functions and dialog areas can be configured for the routine dialog.

Administrator rights can be assigned to users who are permitted to administer methods and to make configuration settings.

If you create a user list, then you can use it in different ways. You can apply different combinations of login options. Three possibilities are listed in the following:

- User name can be selected in the main dialog without login
- Automatic login with USB flash drive
- Login with password

9.1 Creating a user list

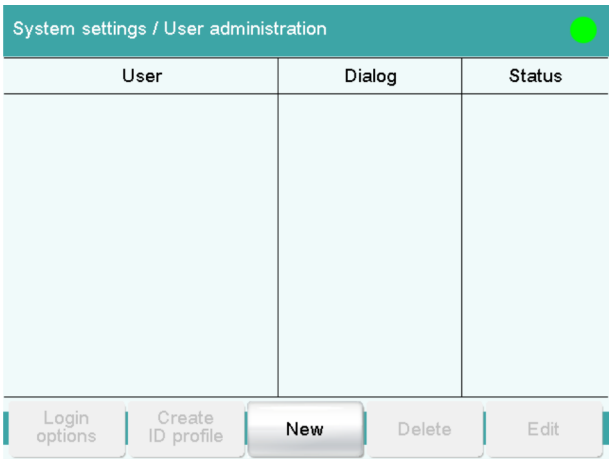
The creation of a user list is required for all of the possibilities of the user login.

Defining users

Proceed as follows:

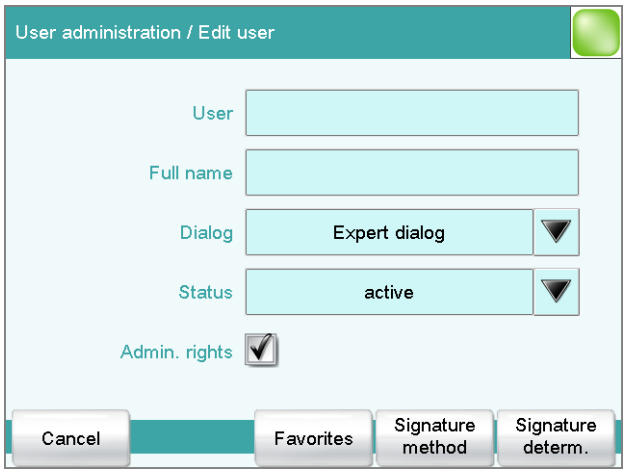
1 Opening the user administration

- In the main dialog, tap on **[System]**.
- Tap on **[System settings]**.
- Tap on **[User admin.]**.



2 Creating a new user

- Tap on **[New]**.



- Tap on the input field **User** and enter an unambiguous user identification (e.g.,abbreviation). Close the input dialog with **[OK]**.
- Tap on the input field **Full name** and enter the name of the user. Close the input dialog with **[OK]**.
- Tap on the selection list **Dialog** and select either **Expert dialog** or **Routine dialog**. Remember that the system settings cannot be changed except in the expert dialog.
  The setting is effective only when working with login.
- Activate or deactivate the administrator rights.
  The user administration can be used only with administrator rights. At least one person must be in possession of administrator rights.
- Return to the user administration with **[** ⇦ **]**.
- Define additional users.
- Return to the main dialog with **[** ⌂ **]**.

If you would like to work without a login, it is sufficient to create a user list. Each user can select his or her entry from the user list in the main dialog. Then the user name will be printed out with reports and/or saved along with a determination.

9.2 Automatic login with USB flash drive

It is possible to have automatic user recognition without requiring that a password be entered. If each user uses a USB flash drive of his or her own with his or her user profile, then the instrument can recognize whose USB flash drive it is at the time of the switching on. User login then takes place automatically.

The USB flash drive can be used for saving determination data, methods, PC/LIMS reports or for backing up the entire system.

Creating user profiles

You now need to create an ID profile for each user on a separate USB flash drive. The USB flash drive must be formatted.

Proceed as follows:

1 Plugging in the USB flash drive

- Return to the main dialog with **[** ⌂ **]**.
- Plug in a USB flash drive into the rear of the 915 KF Ti-Touch.
- Wait until a message appears which confirms that the USB flash drive has been recognized.

2 Saving the user profile

- Switch over to the user administration with **[System]**, **[System settings]** and **[User admin.]**.
- Select a user name.
- Tap on **[Create ID profile]**.

A message will appear which confirms the creation of the ID profile.

If you now set the login options, you will automatically be logged in at once with this ID profile.

Setting the login options

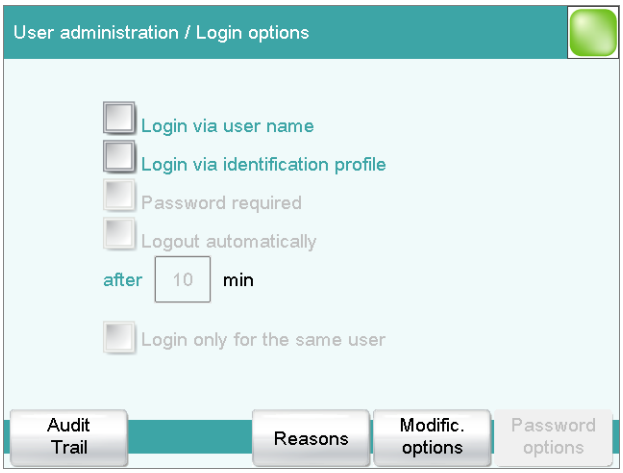
NOTICE

The following steps are possible only if the user has administrator rights.

Proceed as follows:

1 Opening the login options

- In the user administration, tap on **[Login options]**.



2 Activating login with ID profile

- Activate **Login via identification profile**.
- Deactivate all other settings.
- Return to the user administration with **[⇦]**.

You can confirm the request following the creation of ID profiles with **[Yes]** if you have created an ID profile beforehand. Make sure that the USB flash drive is plugged in.

NOTICE

If you have not yet created any ID profiles, then you must confirm the request with **[No]**. Then you can deactivate the **Login via identification profile** and create an ID profile in the user administration.

Confirm any messages which may appear with **[Yes]**.

An automatic login will now take place.

3 Logging in

- Tap on **[OK]** after the request that you plug in the USB flash drive with your ID profile.
- In order to log in another user with ID profile, tap in the main dialog on **[Control/ Logout]** and afterwards on **[Logout]**.
  The request appears once again to plug in a USB flash drive.

9.3 Login with password

If you wish to make it imperative that each user log in on the instrument with a password, then you can activate this in the login options.

NOTICE

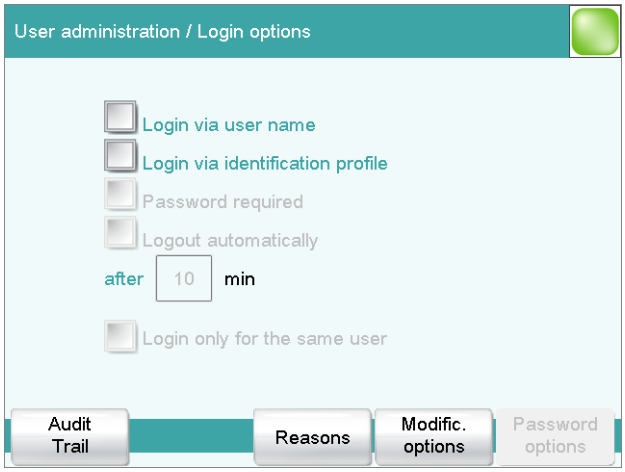
Please note that you will no longer be able to delete the entries created in the user administration once you have activated the password request. The only option available afterwards is to deactivate users.

Setting the login options

Configure the following settings:

1 Opening the login options

- Use **System** ▸ **System settings** ▸ **User admin.** to switch over to user administration.
- Tap on **[Login options]**.



2 Adjusting the settings

- Activate **Login via user name**.

- Activate **Password required**.

Many settings are possible in the login options. Consult the manual of the 915 KF Ti-Touch to look these up if necessary.

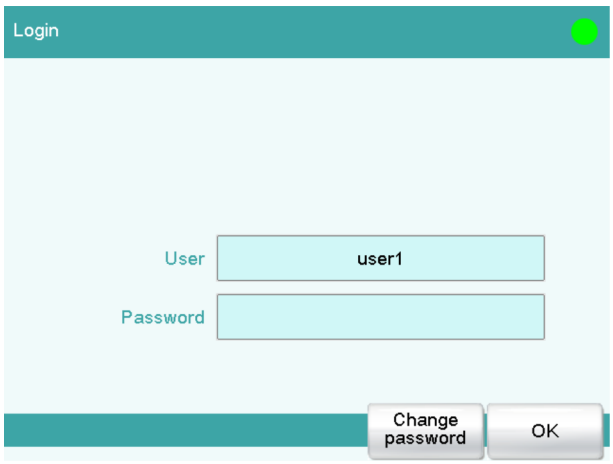
NOTICE

The login dialog is called up as soon as you exit the login options dialog with **[** ⇦ **]** or **[** ⌂ **]**. You must then log in for the first time. You must define and enter a password to accomplish this.

If the login dialog is not called up, switch the instrument off and then back on again.

First login

You must define a password at the time of the first login on the instrument. Proceed as follows:



1 Entering the user name

- Tap on the input field **User**, enter the user name and confirm with **[OK]**.
- Tap on **[Change password]**.

2 Defining a password

- Tap on the input field **New password**.
- Enter a password. It may not be more than 10 characters long.

NOTICE

Note the password.

- Confirm the entry with **[OK]**.
- Enter the password once again under **Confirm password**.
- Tap on **[OK]**.

3 Logging in

- Enter the new password under **Password** and tap on **[OK]** in the login dialog.